Remote Control DEMO KIT User's Guide

Introduction

This DEMO KIT is a set of Infrared transmitter and receiver wherein NEC Infrared format code is implemented, refer to Figure 1 below. The receiver part receives and decodes the keypad commands and changes the display mode per function keys. This User's Guide describes mainly the receiver functions.

MCUs

The HT48RA0-1 is used in the transmitter part and the HT48R10A-1 is used in the receiver part.

Code Format

This DEMO KIT employs the NEC format code.

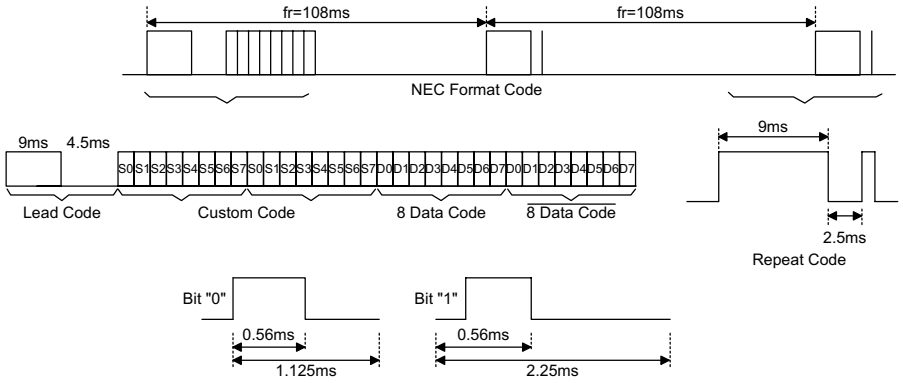


Figure 1. NEC Format Code

DEMO KIT Outline

The DEMO KIT consists of a remote control transmitter part (left) and a receiver part (right) as shown in the figure below.

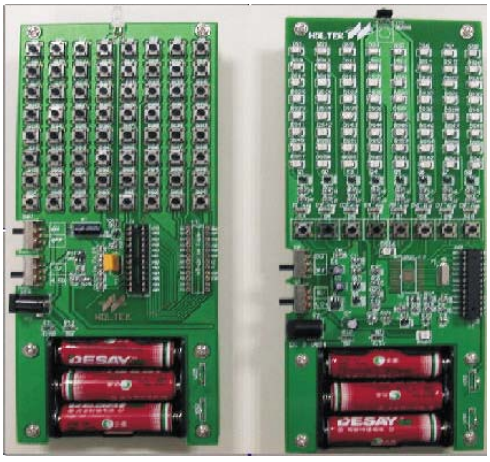


Figure 2. DEMO KIT Outline

Usage

Power Supply

The power supply to both the transmitter and receiver part could come from any of the three sources: 3 battery cells, a 9-volt battery or a 9-volt DC power supply. Choose the power supply and the correct switch settings on the DEMO KIT, see Figure 3 below.

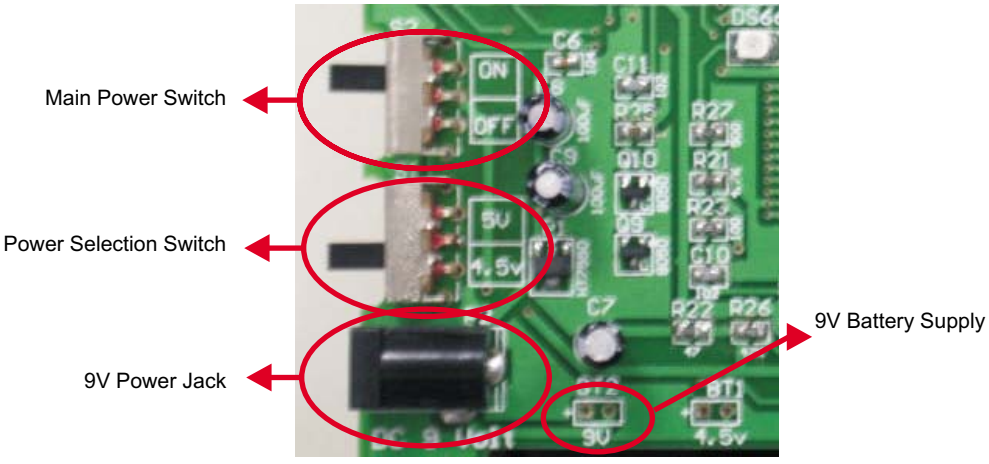


Figure 3. Power Supply Switches

Note Power Selection Switch:
3 Battery Cells: 4. 5V
9-volt Battery: 5V
9-volt DC Power Supply: Not valid

Getting Started

Turn on the main switch first and then select the receiver display mode by pressing the S3~S6 while the S7~S10 are reserved for future use, see Figure 4 below.

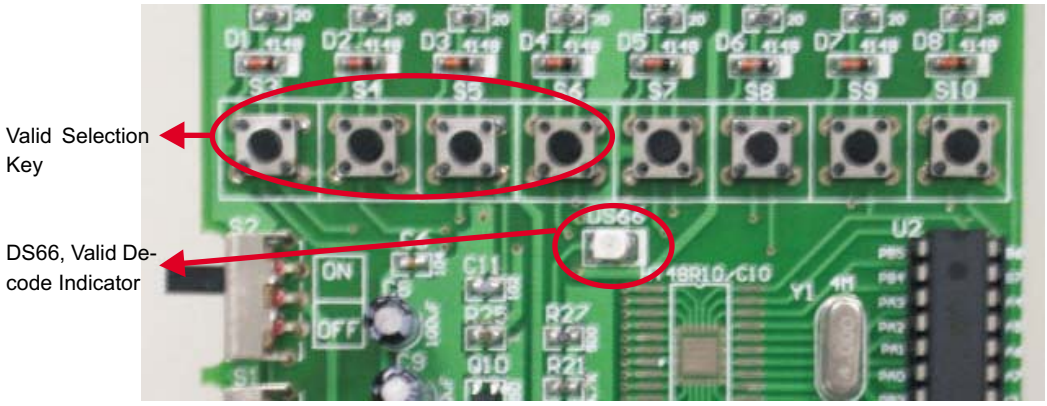


Figure 4. Display Mode Selection Keys

Display Modes

The display area is an 8×8 LED array, see Figure 5 below.

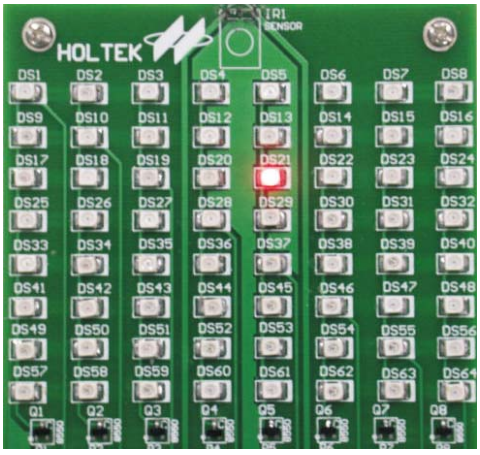


Figure 5. LED Display Array

The available display modes are:

- Mode 1:
  Press Key S3. The LED corresponding to the emitter key position will light up, as shown in Figure 5, when the S21 switch of the emitter is pressed.
- Mode 2:
  Press Key S4. The LED with the mirror position to the emitter key array will light up.
- Mode 3:
  Press Key S5. Display the CUSTOM CODE alternately at a 1sec rate with the lower byte code underlined. In this DEMO KIT, the CUSTOM CODE is 2C48H, so it will display 2C first and then 48 (underlined), alternately every 1sec.
- Mode 4:
  Press Key S6. Display the corresponding key DATA CODE, lighted 50 is shown in Figure 7.

Note If mode 3 is selected, after the first time the valid code is received, the DEMO KIT will display the CUSTOM CODE continuously until the display mode is changed and a valid code is received. Note that to determine whether a valid code is received or not, users can only tell it by the light flash of the DS66.

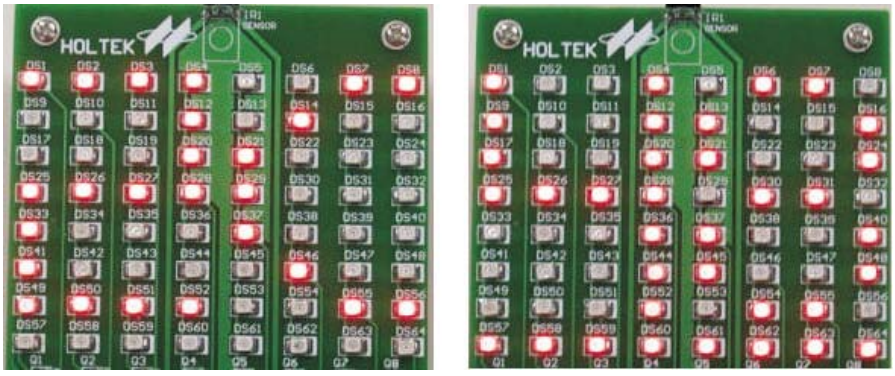


Figure 6. Display Custom Code

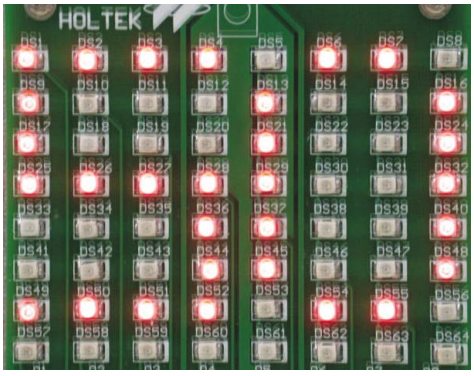


Figure 7. Display Data Code

On the receiver part of the DEMO KIT, there are two special LEDs, DS65 and DS66. The DS65 LED flashing is controlled by the hardware circuit whenever there is Infrared signal detected at the sensor. Refer to the circuit diagram of the receiver part. The DS66 LED illumination is controlled by the MCU if the code is valid, otherwise, the DS66 LED remains off, see Figure 8 below.

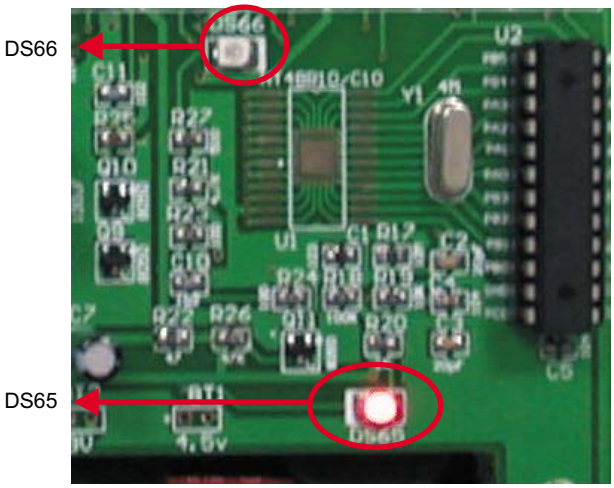


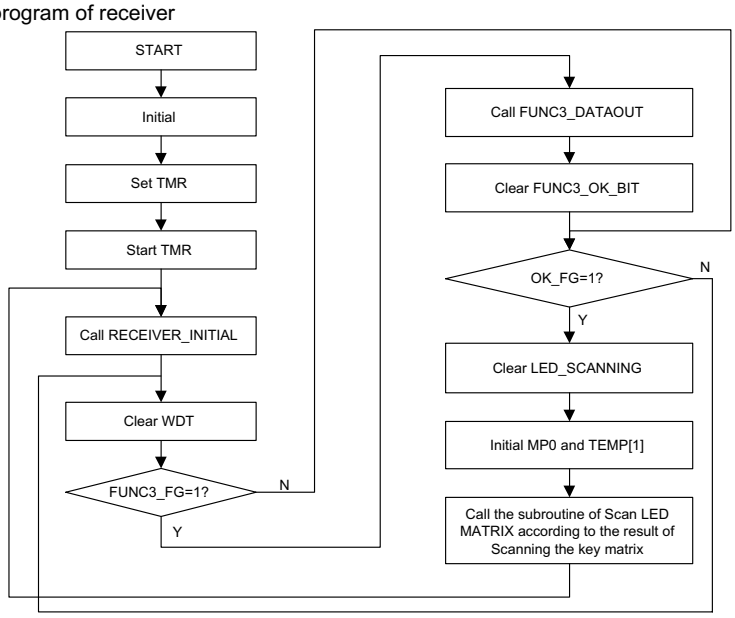
Figure 8. Two special LEDs

After the receiver display mode setting is completed, user can start to use the DEMO KIT.

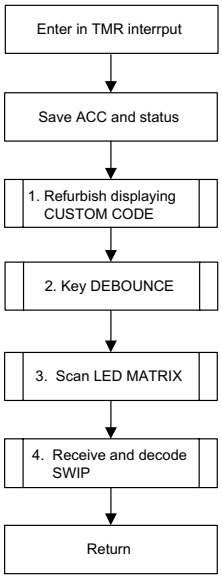
Flowchart (Receiver Part)

The whole program consists of the main procedure and the TMR interrupt service routines. There are 4 interrupt service routines, namely, Custom Code Display Refreshing, Keying Debounce, LED Matrix Scanning and Infrared Decoding.

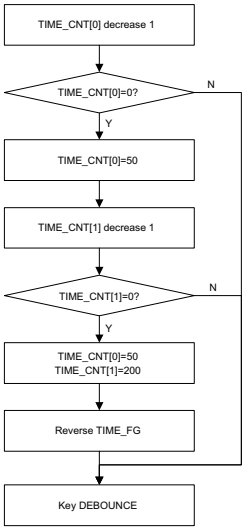
- Main program of receiver



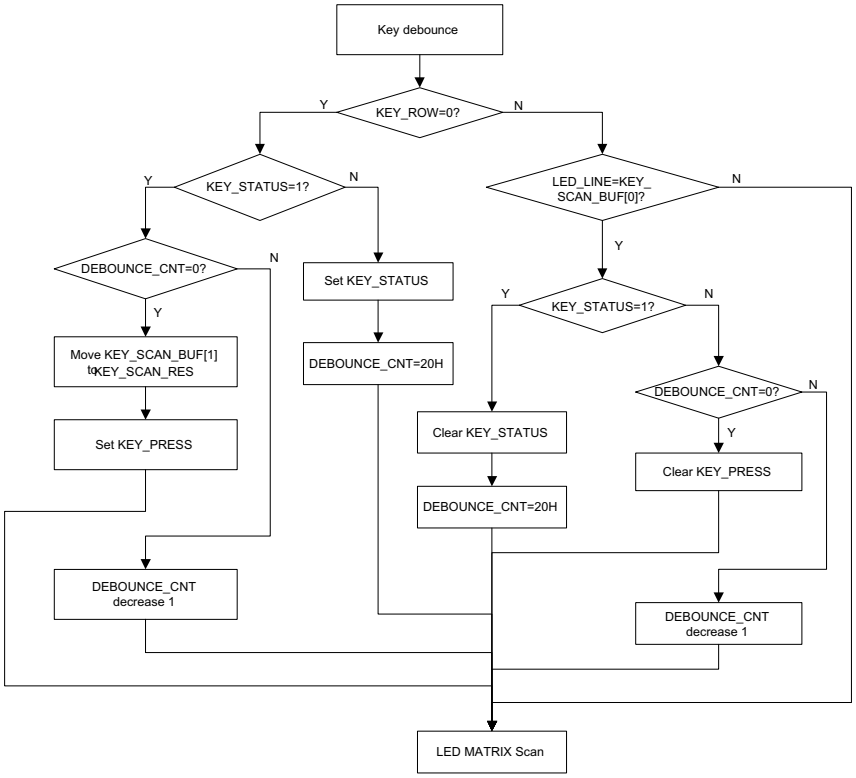
- TMR interrupt subroutine



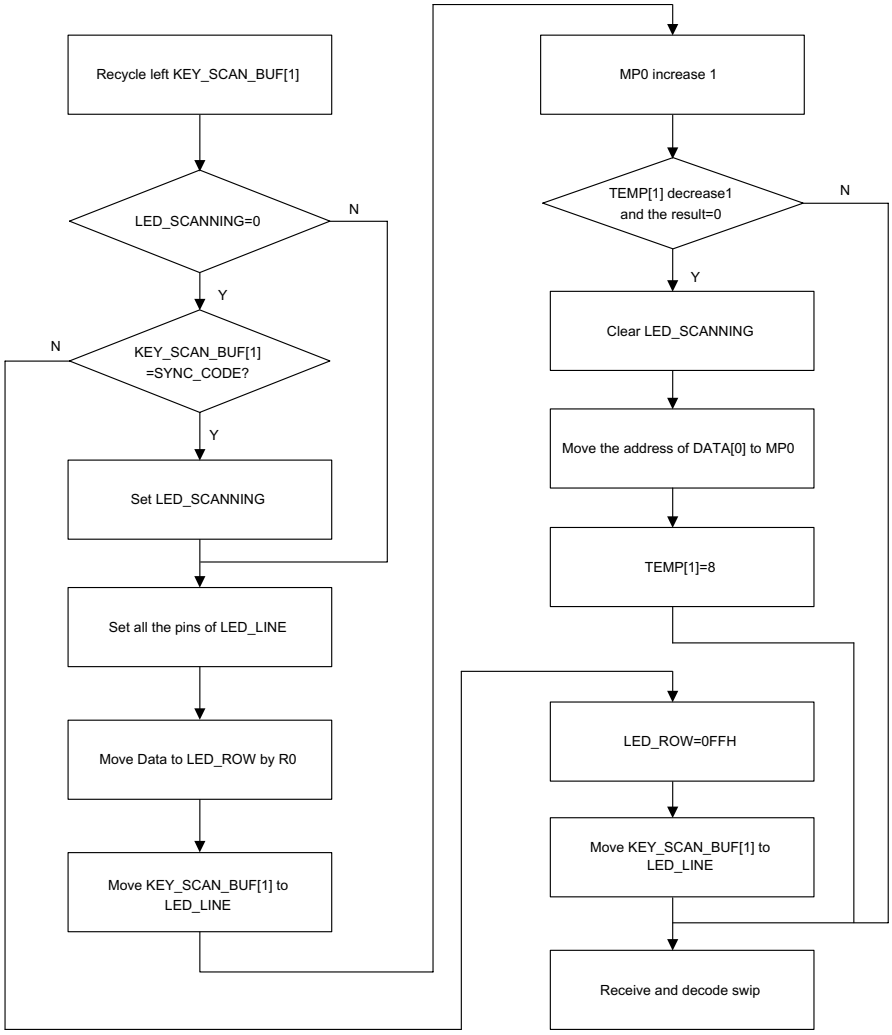
1. Refurbish displaying custom code



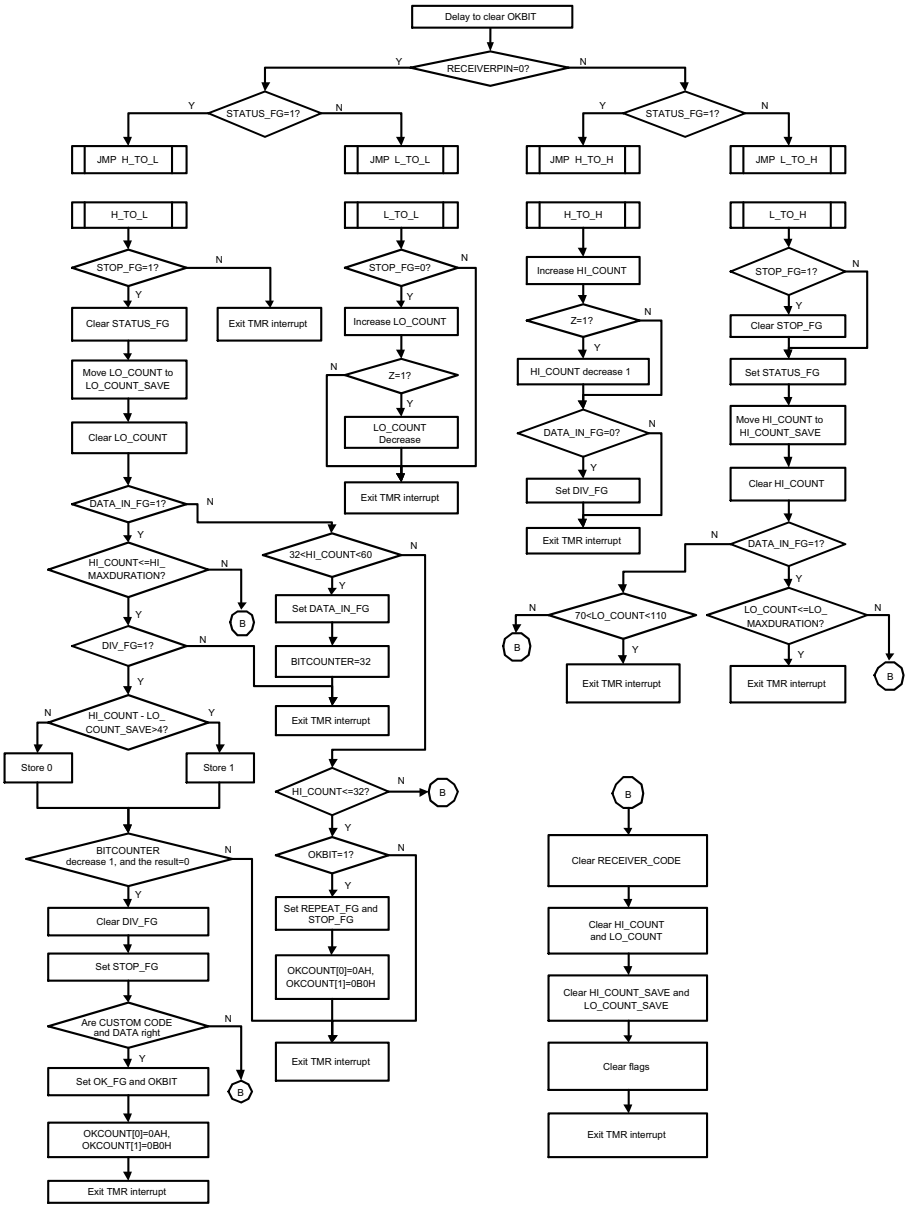
2. Key debounce



3. Scan LED matrix

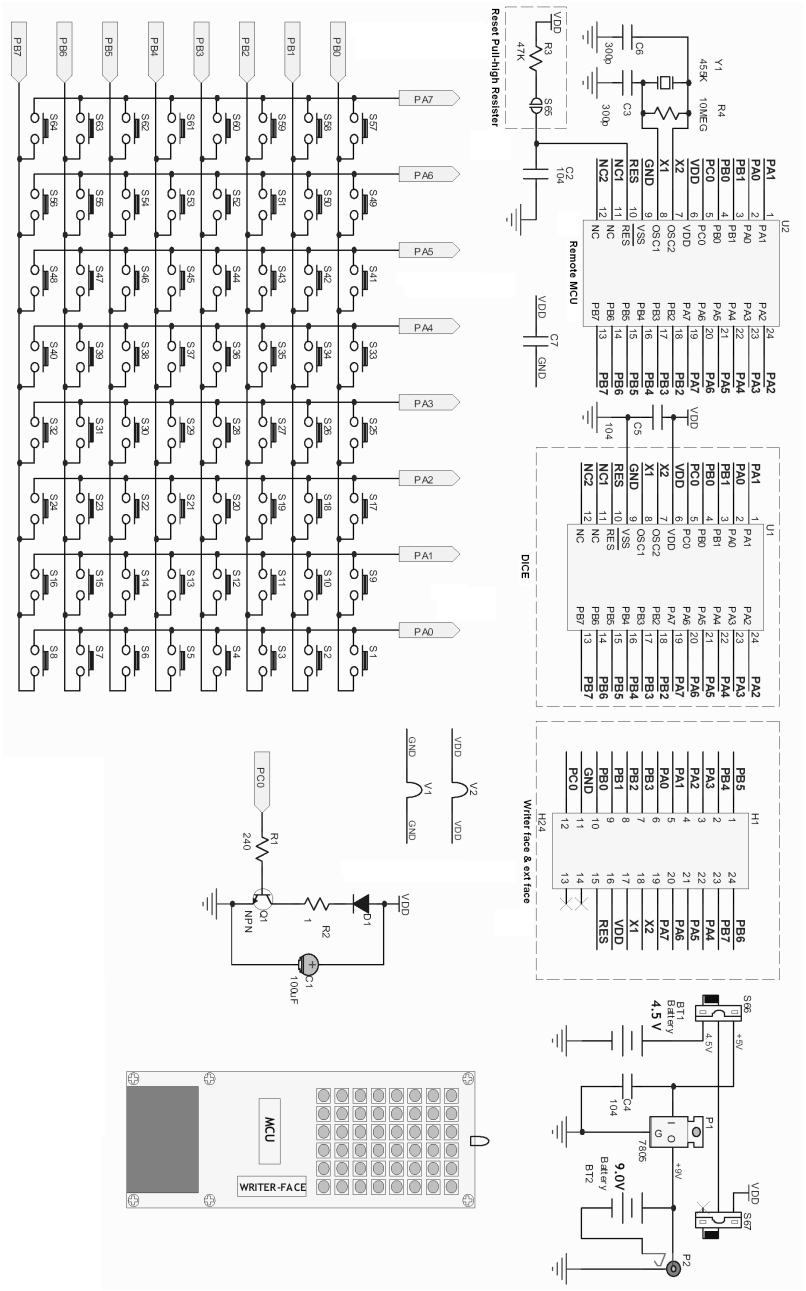


4. Receive and decode SWIP



Circuit Diagram

Emitter Part



Receiver Part